(g) a polynucleotide encoding a protein comprising a fragment of the amino acid sequence of SEQ ID NO:19 having thioredoxin catalytic activity; and

(h) a polynucleotide that hybridizes under conditions of 65°C and 1 x SSC or 42°C and 1 x SCC, 50% formamide, both washed at 65°C with 0.3 x SCC to any one of the polynucleotide specified in (a)-(g) and which encodes a protein having thioredoxin catalytic activity.

REMARKS

Nonelected protein claims have been cancelled. Regarding nonelected claims directed to polynucleotides (e.g., claims 68, 108, 114, 165, 192, 238 and 253), it was understood the Rules of Practice permitted Applicants to simultaneously prosecute up to ten unrelated sequences. Clarification is respectfully requested.

Claim 30 has been amended to better recite the patentable nature of the present invention. The subject matter of the amendment is found in the specification at page 145, lines 22-24 and page 206, (Stringency condition "A"). Accordingly, no new matter has been added.

The Examiner has required that Applicants affirm their previous election to prosecute the invention of Group I, namely claim 30. That election is hereby affirmed. However, it was understood the Rules of Practice permitted Applicants to prosecute simultaneously up to ten unrelated sequences. Clarification in this regard is respectfully requested.

Claim 30 stands rejected under 35 U.S.C. §112, first paragraph, as failing to be supported by an enabling disclosure. Although this rejection is, respectfully solely in order to address the Examiner's concerns and reduce the issues, an executed Deposit Declaration is enclosed. Accordingly, this rejection is mooted.

The Examiner also objected to Claim 30 because subpart (i) does not recite biological activity, because subparts (d and e) are unclear, because subparts (k) and (g) do not specify structural guidelines and because subpart (f) does not provide hybridization conditions. These matters have been attended to in the foregoing amendment.

Claim 30 is rejected under 35 U.S.C. §101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well-established utility.

As the Examiner is aware, the claimed subject matter is a full-length clone that encodes a secreted protein isolated from human adult testes[1/] that is sufficiently similar to human adult T cell leukemia derived factor, especially ATL-derived factor/thioredoxin that those of ordinary skill expect it to share activity with these proteins and believe they will exhibit thioredoxin catalytic activity.[2/]

In response, the Examiner states (1) Applicants' asserted utility is not specific, e.g., it is applicable to any naturally occurring polypeptide and (2) Applicants' statement (in the specification) "based on sequence similarity, fq 505_4 proteins and each similar protein or peptide may share at least some activity" is insufficient[3/]; in other words, the Examiner points out Applicants do not assert fq 505_4 proteins "have any demonstrated function" (emphasis added). Those points are addressed in turn.

1/ Specification page 144, line 35.

2/ Specification page 144, lines 14-29.

3/ Regarding the Examiner's technical analyses of the unpredictable activity resulting from amino acid changes, such is based on old art and is not the current position of either those of ordinary skill, or the Patent and Trademark Office. That is, while changes do occur (and some are plainly drastic), similarity is, nevertheless, now reasonably expected, as discussed below.

As noted, the claims are rejected under 35 U.S.C. § 101 as not having a specific and substantial utility that is credible (USPTO Utility Examination Guidelines, 66 Fed. Reg. at 1098). In this regard, the Examiner necessarily contends (i) the activity of the present invention is not credible since (ii) those of ordinary skill recognize protein activity cannot be predicted from known homologous sequences. According to the Examiner, implicitly at least, the pending claims do not satisfy the utility requirement of 35 USC 101 because, given the state of the art, structure-function analysis is unpredictable. This basis of rejection is, respectfully submitted, without foundation either in law or in fact.

The Examiner's point concerning the unpredictability of protein activity from known homologous sequences is not well-taken by those of ordinary skill or, for that matter, the Patent Office. See, e.g., Principles of Protein Structure, Cantor, ed. (1978) 167 wherein it is explicitly taught that

> "[h]omologous proteins result from speciation or differentiation. Comparisons between homologous proteins have yielded general rules for protein structures (citing Schulz, Angew. Chem. Int. Edit., Vol. 16 (1977) 23-33). . . . In this context it is often useful to distinguish between protein speciation and protein differentiation (citing Molecular evolution and Polymorphism, Kimura ed. (1977) National Institute of Genetics, Mishima, Japan). Speciation is the evolution of homologous proteins possessing a common function in different organisms."

This knowledge is summarized in the art as evidencing that establishing homology between the unknown and reference proteins permits the skilled artisan to assume the unknown unexpressed protein and the known reference protein have the same function. Functional Genomics, Science, Vol. 278, No. 601 (1997).

This is not an aberrant position; similarly, the American Society of Human Genetics ("ASHG") similarly acknowledges "sequence homology is a useful predictor of gene function." Letter from Ronald Worton, Ph.D., President, ASHG, to the Honorable Q.

Todd Dickinson, Assistant Secretary of Commerce and Commissioner of Patents and Trademarks, Unites States Patent and Trademark Office at 2 (Mar. 22, 2000) (on file with the USPTO).

As noted, the USPTO too recognizes the state of this art in Example 10 of the Utility Training Materials: DNA fragments encoding a Full Open Reading Frame (ORF). In the example the Examiner is directed not to reject the claims merely because the applicant's asserted utility is premised on the "overall level of sequence similarity between SEQ ID NO:3 [the unknown sequence] and the consensus sequence of the known DNA ligases that are presented in the specification." Indeed, Example 10 acknowledges that "homology between the known and unknown protein is sufficient to ascribe the known protein's function to the unknown; thus the claim possesses credible, substantial, and specific utility."[4/] Id. at 54.[5/]

Moreover, the PTO acknowledges as well utility is well-established if it is readily apparent to one skilled in the art. Id. at 55. This is in conformity with the law promulgated by the Federal Circuit, which notes 35 U.S.C. 112 can be satisfied even by "genus claims to nucleic acids based on their hybridization properties, . . . [if the subject matter of the claims will] hybridize under highly stringent conditions to known sequences because such conditions dictate that all species within the genus will be structurally

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4/ In fact, the guidelines make clear there is no minimum percentage required and directs the Examining corp not to focus on numbers.

5/ To the extent the Examiner maintains Applicants' statements at specification page 145 are too vague, they will promptly file a Declaration under Rule 132 explicitly stating "fq 505_4 has sufficient homology with known proteins that those of ordinary skill expect it to exhibit thioredoxin catalytic activity", if such will be helpful to the Examiner. Alternatively, the Examiner can take this representation as being made by authorization. Clarification in this regard is respectfully requested.

similar." Enzo Biochem v. Gen-Probe, Appeal No. 01-1230 slip op. granting reh'g at 15 (Fed. Cir. July 15, 2002).

See for instance, in In re Folkers, 145 USPQ 390 (CCPA 1965), where a new compound belonging to the known family of quinones and hydroquinones was alleged, without more, to have the electron transport activity of that known class. Id at 393. The predecessor court to the Federal Circuit held that function is inferred based on similarity to a substance with a known function. Id. Similarly, in In re Brana 34 USPQ 1436, 1442 (Fed. Cir. 1995), the Federal Circuit noted

> "[a]lthough it is true that minor changes in chemical compounds can radically alter their effects on the human body, evidence of success in structurally similar compounds is relevant in determining whether one skilled in the art would believe an asserted utility."

Applicants wish to point out that, at the very least, the resemblance of the present invention to specific proteins of known activity makes it clear the present invention can be further utilized as research tools for better characterizing those prior art compounds. Regarding this point, that asserted utility, e.g., to better characterize prior art cadherins, is specific. That is, while specific utility excludes generalized research tools like probes, such is not so, however, when the target being probed for is already known. Revised Interim Utility Guidelines Training Materials at 50-53.[6/]

Accordingly, respectfully submitted, the rejection under 35 U.S.C. § 101 is overcome and withdrawal thereof is earnestly solicited.

Claims 30 is also rejected under 35 U.S.C. §112 first paragraph. In support of this rejection, the Examiner states that because the invention is not supported by a

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6/ In this regard, the PTO decided use as research tools is specific if the homologous prior art sequence has a known function, since such use tools is plainly specific to the homologous prior art sequence. See the Federal Circuit Bar Journal, Vol. 11, No. 4 (2002) 918.

substantial asserted utility, one of ordinary skill would not know how to use it. However, as seen explained above, the present invention is supported by a specific and substantial utility.

Claim 30 stands rejected under 35 U.S.C. §102(a) as anticipated by Agostino (AAU99731) and Jacobs (WO 98/56909).

As to Jacobs, such claims priority to U.S. 09/092,722, as does the instant application. Jacobs is plainly not prior art hereto.

As to Agostino, his secreted protein (AAU95351) may have 100% identify to SEQ ID NO:19, but such is no longer relevant to subpart (e), which has been deleted from claim 30. In any event, fq 505_4 is understood to be supported by 60/086,236 filed June 11, 1997 and so Agostino is not prior art either.

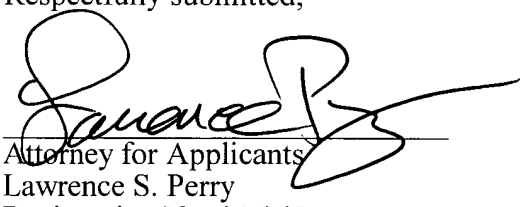
Regarding a final formal matter, the Draftsperson has objected to the drawings for the reasons noted. Corrected drawings are being prepared currently and will be filed as soon as possible.

In view of the above amendments and remarks, Applicants submit that all of the Examiner's concerns are now overcome and the claims are now in allowable condition. Accordingly, reconsideration and allowance of this application is earnestly solicited.

Claims 30 remains presented for continued prosecution.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS

30. (Amended) An isolated polynucleotide selected from the group consisting of:

(a) a polynucleotide comprising the nucleotide sequence of SEQ ID NO:18;

(b) a polynucleotide comprising the nucleotide sequence of SEQ ID NO:18 from nucleotide 84 to nucleotide 404;

(c) a polynucleotide comprising the nucleotide sequence of SEQ ID NO:18 from nucleotide 78 to nucleotide 493;

(d) [a polynucleotide comprising the nucleotide sequence of the full-length protein coding sequence of clone fg505_4 deposited under accession number ATCC 98451;

(e) a polynucleotide encoding the full-length protein encoded by the cDNA insert of clone fq505_4 deposited under accession number ATCC 98451;

(f)] a polynucleotide comprising the nucleotide sequence of a mature protein coding sequence of clone fq505_4 deposited under accession number ATCC 98451;

(e) [(g)] a polynucleotide encoding a mature protein encoded by the cDNA insert of clone fq505_4 deposited under accession number ATCC 98451;

(f) [(h)] a polynucleotide encoding a protein comprising the amino acid sequence of SEQ ID NO:19;

(g) [(i)] a polynucleotide encoding a protein comprising a fragment of the amino acid sequence of SEQ ID NO:19 having [biological] thioredoxin catalytic activity[, the fragment comprising eight consecutive amino acids of SEQ ID NO:19];

[(j) a polynucleotide which is an allelic variant of a polynucleotide of (a)-(g) above;

(k) a polynucleotide which encodes a species homologue of the protein of (h) or (i) above;] and

(h) [(l)] a polynucleotide that hybridizes under [stringent] conditions of 65°C and 1 x SSC or 42°C and 1 x SCC, 50% formamide, both washed at 65°C with 0.3 x SCC to any one of the polynucleotide specified in (a)-[(i)] (g) and which encodes a protein having thioredoxin catalytic activity.

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#12

Letter

01997.022400

PATENT APPLICATION

1/8/03

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	:	Examiner: Rita Mitra
Kenneth Jacobs et al.	)	
	:	Group Art Unit: 1653
Application No.: 09/746,783	)	
	:	
Filed: December 21, 2000	)	
	:	
For: SECRETED PROTEIN AND POLYNUCLEOTIDES ENCODING THEM	)	December 2, 2002

Commissioner for Patents
Washington, D.C. 20231

NOTICE RE DEPOSIT OF MICROORGANISMS

Sir:

The above-identified application discloses a cell line which has been deposited with the American Type Culture Collection under the following designation:

Accession Number: ATCC 98451

The deposit has been made with the American Type Culture Collection under the terms and conditions of the Budapest Treaty. Access to the deposit will be accorded to the Assistant Commissioner upon request and any restrictions upon availability to the public will be irrevocably removed upon granting of any patent issuing on this application or any continuation, divisional or continuation-in-part applications. Maintenance of the deposit is assured for periods of time as specified in the Budapest Treaty.

Assignee will replace the cultures if any should become non-viable for a period of at least five (5) years after the most recent request for the furnishing of a sample of deposited microorganism, for a period of at least thirty (30) years after the date of deposit or for the enforceable life of such patent, whichever is longer.

Lawrence S. Perry
Attorney for Applicants
Registration No. 31,865

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